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=> FILE REG
FILE 'REGISTRY' ENTERED ON 06 MAY 2008
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=> DISPLAY HISTORY FULL L1-

     FILE 'REGISTRY' ENTERED ON 06 MAY 2008
                E CARBON/CN
L1            1 SEA CARBON/CN
L2        27886 SEA 50-00-0/CRN
                E UREA/CN
L3            1 SEA UREA/CN
                E MELAMINE/CN
L4            1 SEA MELAMINE/CN
L5            2 SEA L3 OR L4
                SEL L5 1-2 RN
                EDIT E1-E2 /BI /CRN
L6        14066 SEA (108-78-1/CRN OR 57-13-6/CRN)
L7         9301 SEA L2 AND L6

     FILE 'HCA' ENTERED ON 06 MAY 2008
L8        47504 SEA L7 OR (FORMALDEHYDE# OR CH2O OR H2CO OR HCHO OR
                FORMALIN#)(2A)(UREA# OR NH2CONH2 OR H2NCONH2 OR MELAMINE#
                )
L9        55654 SEA POLYISOCYANAT? OR (?ISOCYANAT? OR NCO OR RNCO)(2A)(AD
                DUCT? OR POLY OR POLYM? OR COPOLYM? OR HOMOPOLYM? OR
                RESIN?)
L10        1094 SEA L1 (L) FOAM?
L11        3133 SEA (CARBON# OR C OR CARBONACEOUS? OR CARBONIFEROUS?)(2A)
                FOAM?
L12      114289 SEA PYROLY?

     FILE 'REGISTRY' ENTERED ON 06 MAY 2008
                E CARBON DIOXIDE/CN
L13           1 SEA "CARBON DIOXIDE"/CN

     FILE 'HCA' ENTERED ON 06 MAY 2008
L14      517144 SEA L13 OR CO2 OR CARBON#(A)DIOXIDE#
L15      352425 SEA STEAM? OR (WATER? OR H2O)(2A)(VAPOR? OR VAPOUR? OR
                GAS## OR GASEOUS? OR GASIF?)
L16          88 SEA L11 AND L12
L17           8 SEA L16 AND (L14 OR L15)
L18           1 SEA L17 AND (L8 OR L9)
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L19          43 SEA L10 AND L12
L20           3 SEA L19 AND (L14 OR L15)
L21           1 SEA L20 AND (L8 OR L9)
L22      156693 SEA FOAM?
L23         893 SEA L22 AND L12
L24         107 SEA L23 AND (L14 OR L15)
L25           5 SEA L24 AND (L8 OR L9)
L26      218040 SEA POLYURETHAN## OR URETHAN## OR POLYAMIC#
L27          42 SEA L24 AND L26
L28       22019 SEA L13 (L) RACT/RL
L29           0 SEA L27 AND L28
L30           0 SEA L17 AND L26
L31           0 SEA L20 AND L26
L32          85 SEA L23 AND L14
L33          29 SEA L23 AND L15
L34           5 SEA L33 AND L26
L35       72629 SEA (HIGH? OR RAIS? OR ELEVAT? OR INCREAS? OR GREAT?)(3A)
                (SURFACE?(2A)AREA# OR SA OR S(W)A OR PORE# OR PORO? OR
                MICROPORO? OR MICROPORE# OR M2(A)(G OR GR OR GRM# OR GM#
                OR GRAM#))
L36       22086 SEA (CELL OR CELLS OR CELLULAR?)(2A)(SIZE# OR SIZING# OR
                DIA# OR DIAM# OR DIAMET? OR RADII? OR RADIUS?)
L37           5 SEA L24 AND L35
L38           5 SEA L24 AND L36

     FILE 'HCAPLUS' ENTERED ON 06 MAY 2008
L39         370 SEA RO!ERMUND ?/AU
L40        2008 SEA HEMPEL ?/AU
L41        4333 SEA HESSE ?/AU
L42         256 SEA RUDLOFF ?/AU
L43           1 SEA DESSEIX ?/AU
L44           1 SEA L39 AND L40 AND L41 AND L42 AND L43
                SEL L44 1 RN

     FILE 'HCA' ENTERED ON 06 MAY 2008
L45      153715 SEA (HIGH? OR RAIS? OR ELEVAT? OR INCREAS? OR GREAT?)(3A)
                SURFACE?
L46      119577 SEA POROSIT?
L47        7432 SEA OPEN?(2A)(CELL OR CELLS OR CELLULAR?)
L48           9 SEA L24 AND (L45 OR L46 OR L47)

     FILE 'REGISTRY' ENTERED ON 06 MAY 2008
L49          12 SEA (101-05-3/BI OR 127-08-2/BI OR 134498-73-0/BI OR
L50           4 SEA L49 AND PMS/CI
L51           8 SEA L49 NOT L50
                E ISOCYANIC ACID/CN
L52           1 SEA "ISOCYANIC ACID"/CN
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                D L50 1-4 IDE

     FILE 'HCA' ENTERED ON 06 MAY 2008
L53       38211 SEA L50 OR L52
L54          13 SEA L53 AND L12 AND L22
L55           2 SEA L54 AND (L14 OR L15)
L56           1 SEA L54 AND (L35 OR L36 OR L45 OR L46 OR L47)
L57          24 SEA L17 OR L18 OR L20 OR L21 OR L25 OR L34 OR L37 OR L38
                OR L48 OR L55 OR L56
L58          14 SEA 1840-2002/PY,PRY,AY AND L57




=> FILE HCA
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=> D L58 1-14 BIB ABS HITSTR HITIND

L58  ANSWER 1 OF 14  HCA  COPYRIGHT 2008 ACS on STN
AN   140:274741  HCA  Full-text
TI   Manufacture of carbon composed foams with
     high internal surface by pyrolysis of
     N-containing polymers
IN   Rotermund, Udo; Hempel, Renate; Hesse, Michael; Rudloff, Jan;
     Desseix, Maryline
PA   BASF AG, Germany
SO   Ger. Offen., 17 pp.
     CODEN: GWXXBX
DT   Patent
LA   German
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.         DATE
     ---------------     ----   --------    --------------------
     --------
PI   DE 10243240          A1    20040325    DE 2002-10243240
                                                                   200209
                                                                   17
                                                       <--
     WO 2004026792        A1    20040401    WO 2003-EP9943
                                                                   200309
                                                                   08
                                                       <--
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

	AU 2003266363	A1	20040408	AU 2003-266363 20030908 <--
	EP 1542941	A1	20050622	EP 2003-797284 20030908 <--
	EP 1542941	B1	20061129	

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

	CN 1681748	A	20051012	CN 2003-822042 20030908 <--
	JP 2006512265	T	20060413	JP 2004-537012 20030908 <--
	AT 346832	T	20061215	AT 2003-797284 20030908 <--
	ES 2277148	T3	20070701	ES 2003-797284 20030908 <--
	US 20060014908	A1	20060119	US 2005-526930 20050308 <--
PRAI	DE 2002-10243240	A	20020917 <--	
	WO 2003-EP9943	W	20030908	

AB The invention concerns a foam contg. ≥70% of carbon and having a middle cell size over 20 μm, a porosity 35-99.5%, as well as open-cell character over 90%, an internal surface over 50 m2/g with cell walls referred to this cell size which contain in the cross section a triangle, and pores in the cell scaffolding material with dimensions from 0.2 nm to 50 nm and a vol. 0.01-0.8 cm3/g. The procedure for producing this foam is based on pyrolysis of synthetic foams, whereby the assigned plastics foam materials (e.g., urea- formaldehyde copolymer or melamine- formaldehyde copolymer) possess at least 30% of a polymer (e.g., polyisocyanate) with a nitrogen content over 6% and a porosity 35-995%, as well as an open-cell character >1%. The pyrolysis is carried out with steam, carbon dioxide, and/or oxygen at ≥400-1200°. The pyrolyzed plastics foam materials may comprise an inorg. component such as aq. dispersion of an inorg. salt (e.g. ZnCl2, CaCO3, or ammonium polyphosphate), metal powder, or graphite. The resulting carbon foam is suitable for filters, thermal insulators, carriers, or semi-product for further processing in electrodes, superconductors, or fuel cell materials.

IT 7440-44-0, Carbon, uses
(carbon foam; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

RN 7440-44-0 HCA

CN Carbon (CA INDEX NAME)

C

IT 9003-08-1, Melamine-formaldehyde copolymer 9011-05-6, Urea-formaldehyde copolymer
(pyrolyzed plastic; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

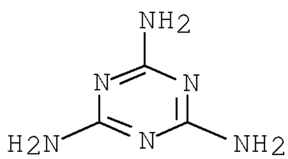
RN 9003-08-1 HCA

CN 1,3,5-Triazine-2,4,6-triamine, polymer with formaldehyde (CA INDEX NAME)

CM 1

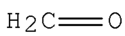
CRN 108-78-1

CMF C3 H6 N6



CM   2

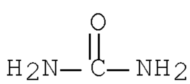
CRN 50-00-0
CMF C H2 O



RN   9011-05-6 HCA
CN   Urea, polymer with formaldehyde (CA INDEX NAME)

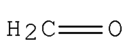
CM   1

CRN 57-13-6
CMF C H4 N2 O



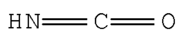
CM   2

CRN 50-00-0
CMF C H2 O



IT   75-13-8D, Isocyanic acid, esters, polymers
(pyrolyzed polymer; manuf. of carbon composed

foams with high internal surface by
pyrolysis of N-contg. polymers)
RN 75-13-8 HCA
CN Isocyanic acid (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 134498-73-0, Lupranate M 50 674292-37-6, Lupranate
M 70
(pyrolyzed polymer; manuf. of carbon composed
foams with high internal surface by
pyrolysis of N-contg. polymers)
RN 134498-73-0 HCA
CN Lupranate M 50 (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 674292-37-6 HCA
CN Lupranate M 70 (9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IC ICM C08J009-22
ICS C08J009-36; C08J011-12
CC 57-8 (Ceramics)
Section cross-reference(s): 38
ST carbon foam ureaformaldehyde
polyisocyanate pyrolysis
IT Polyphosphoric acids
(ammonium salts, additive; manuf. of carbon composed
foams with high internal surface by
pyrolysis of N-contg. polymers)
IT Electrodes
Filters
Fuel cells
Superconductors
Thermal insulators
(carbon foam for; manuf. of carbon
composed foams with high internal
surface by pyrolysis of N-contg. polymers)
IT Foams
Porosity
(carbon foam; manuf. of carbon
composed foams with high internal
surface by pyrolysis of N-contg. polymers)
IT Polysiloxanes, uses
(di-Me, hydroxypropyl Me, ethoxylated propoxylated, Tegostab
B8461, surfactant; manuf. of carbon composed

foams with high internal surface by
pyrolysis of N-contg. polymers)

IT Polysiloxanes, uses
(polyoxyalkylene-, Tegostab B8409, surfactant; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT Polyoxyalkylenes, uses
(polysiloxane-, Tegostab B8409, surfactant; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT Thermal decomposition
(pyrolysis; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT Aminoplasts
(pyrolyzed plastic; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT Amines, uses
(triamines, propellant; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT 471-34-1, Calcium carbonate ($CaCO_3$), uses 7646-85-7, Zinc chloride ($ZnCl_2$), uses 7782-42-5, Graphite, uses
(additive; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT 7440-44-0, Carbon, uses
(carbon foam; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT 127-08-2, Potassium acetate
(catalyst; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT 101-05-3, Triazin
(propellant; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT 9003-08-1, Melamine-formaldehyde copolymer 9011-05-6, Urea-formaldehyde copolymer
(pyrolyzed plastic; manuf. of carbon composed foams with high internal surface by pyrolysis of N-contg. polymers)

IT   75-13-8D, Isocyanic acid, esters, polymers
        (pyrolyzed polymer; manuf. of carbon composed
        foams with high internal surface by
        pyrolysis of N-contg. polymers)
IT   134498-73-0, Lupranate M 50 674292-37-6, Lupranate
     M 70
        (pyrolyzed polymer; manuf. of carbon composed
        foams with high internal surface by
        pyrolysis of N-contg. polymers)
IT   215512-68-8, Ortegol 501
        (stabilizer; manuf. of carbon composed foams
        with high internal surface by
        pyrolysis of N-contg. polymers)

L58 ANSWER 2 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN   138:90783 HCA Full-text
TI   Polyurethane recycling
AU   Sadadinovic, J.; Ilickovic, Z.
CS   Katedra Tehnol. Ekol., Tehnol. Fak., Sveuciliste Tuzla, Tuzla, 75000, Bosnia/Herzegovina
SO   Kemija u Industriji (2002), 51(10), 431-436
     CODEN: KJUIAR; ISSN: 0022-9830
PB   Hrvatsko Drustvo Kemijskih Inzenjera i Tehnologa
DT   Journal; General Review
LA   Croatian
AB   A review. The problem of polyurethane waste recycling has major technol., ecol. and economical significance since polyurethane (PUR) is relatively expensive, and its disposal whether by burning or landfill is also costly. This paper gives the overview of existing options of PUR recycling used in industrial practice, as well as the review of alternative options of recycling of PUR waste that might be realized in practice in the near future. PUR may be recycled using phys. and chem. methods. Several phys. methods for PUR were developed such as grinding, compression molding, and adhesive pressing. Grinding has a special importance in this field, because it is the starting operation of almost all PUR recycling methods. Grinding transforms PUR foam waste into powders that can be used in the prodn. of new foams. Two methods for grinding PUR waste were developed, i.e., cryogenic grinding based on liq. nitrogen and grinding under ambient conditions. Adhesive pressing is a technique where PUR granules are mixed with PUR binder and then cured under heat and pressure. In USA, annually over 300,000 tons of elastic PUR foam scrap are recycled into carpet underlay by using this method. Some type of polyurethanes (elastomers) can be reshaped by compression molding at temps. just below the degrdn. temp. Chem. recycling based on converting of PUR polymer into starting compds. may be used to manuf. new PUR products. Most frequently used options

are glycolysis and hydrolysis. The reagent used for hydrolysis process is steam. Hydrolysis can produce polyols and amine but their reuse requires addnl. purifn. Glycolysis is a process where PUR reacts with diols (aliph. glycols) at elevated temp. to produce a glycolyzates-polyols, which can be used as a part of major polyol component in new PUR foam prodn. ICI-split phase glycolysis and BASF-method are the best known glycolysis processes used on industrial scale. Incineration with energy recovery presents a valid option of PUR recycling, esp. since the energy value of PURs is .apprx.35 MJ kg-1. Hydrogenation and pyrolysis are the promising techniques theor. applicable for PUR recycling. Those processes can break down PUR waste (and other plastics) to a valuable petrochem. feed stocks using heat, pressure, and hydrogen.

CC 38-0 (Plastics Fabrication and Uses)
Section cross-reference(s): 39

ST review polyurethane urethane rubber recycling

IT Size reduction
(in recycling of polyurethanes)

IT Polyurethanes, processes
Urethane rubber, processes
(recycling of)

IT Recycling of plastics and rubbers
(recycling of polyurethanes and urethane rubber)

L58 ANSWER 3 OF 14 HCA COPYRIGHT 2008 ACS on STN

AN 131:185680 HCA Full-text

TI Laser pyrolysis/time-of-flight mass spectrometry studies pertinent to the behavior of flame-retarded polymers in real fire situations

AU Price, Dennis; Gao, Fengge; Milnes, G. John; Eling, B.; Lindsay, C. I.; McGrail, P. T.

CS Chemical Sciences Division, Science Research Institute, University of Salford, Greater Manchester, M5 4WT, UK

SO Polymer Degradation and Stability (1999), 64(3), 403-410
CODEN: PDSTDW; ISSN: 0141-3910

PB Elsevier Science Ltd.

DT Journal

LA English

AB The Salford laser pyrolysis/time-of-flight mass spectrometry (LP/TOFMS) technique, which models the behavior in the dark flame region behind the flame front in a polymer fire, was applied to study flame-retarded poly(Me methacrylate) (PMMA), rigid polyurethane foam systems, and phosphorus retarded rigid polyurethane foams and a model urethane compd. The laser pyrolysis of aluminum oxide trihydrate (ATH) retarded PMMA produces a large amt. of water and carbon dioxide in the volatiles. Also, the amt. of the monomer evolved is reduced

significantly compared to that obtained from pure PMMA. The implication of these results is that in a real fire situation, ATH influences PMMA pyrolysis in such a manner as to bring about a redn. in the evolved fuel while at the same time adding non-combustible gases (e.g. water) to the flame region. Thus is the PMMA flame retarded. The rigid polyurethane foams studied varied in isocyanate index and the mol. wt. of the polyols applied. The flame retardance of these materials was shown to increase with increasing isocyanate index and wt. fraction of isocyanate. Laser pyrolysis expts. of these samples showed that the major volatiles evolved were dominated by monomer and oligomers of the polypropylene glycol used to produce the foam, plus lower mol. wt. species of which carbon dioxide appeared to be a significant part. An increase in isocyanate index results in a redn. in the extent of monomer/oligomer evolution and an increase in the low mol. wt. species. With ref. to the behavior of the foams in a real fire situation, it could be imagined that the monomer/oligomer components and their breakdown products would act as fuel in the flame region while the low mol. wt. species dominated by carbon dioxide would be relatively non-flammable. An increase of isocyanate index is equiv. to making less fuel and more of the inert gases available to the burning zone and hence improving the fire resistance of the rigid polyurethane foams. The flame retardant mechanism of phosphorus, introduced as low percentages of di-Me methylphosphonate, is also attributed to a redn. in fuel evolution via pyrolysis of rigid polyurethane foams.

CC 37-5 (Plastics Manufacture and Processing)

ST polymethyl methacrylate flame retardant mechanism aluminum oxide; polyurethane foam flame retardance isocyanate index; polyol mol wt polyurethane foam flame retardance; phosphorus retarded polyurethane foam burning mechanism; laser pyrolysis mass spectrometry flame retardancy polymer

IT Combustibles
   (gaseous; laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)

IT Fire
   Fire-resistant materials
   Fireproofing agents
   Flammability
   (laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)

IT Plastic foams
   Polyurethanes, processes
   (laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in

real fire situations)
IT   Oxygen index
(limiting; laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
IT   Polymer degradation
(thermal; laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
IT   1066-53-1, Methyl methylphosphonate   21645-51-2, Aluminum oxide trihydrate, uses
(flame retardant; laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
IT   80-62-6   124-38-9, Carbon dioxide, formation (nonpreparative) 7732-18-5, Water, formation (nonpreparative)
(laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
IT   9011-14-7, PMMA   9048-57-1, MDI-poly(propylene glycol) copolymer
(laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
IT   239438-61-0, n-Butyl (4-benzyl)phenylcarbamate
(model urethane compd.; laser pyrolysis/TOFMS studies of flame retardant mechanism of PMMA and polyurethane foams in real fire situations)
RE.CNT 14   THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 4 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN   129:98895 HCA Full-text
TI   Polyurethane based organic aerogels and their transformation into carbon aerogels
AU   Biesmans, G.; Mertens, A.; Duffours, L.; Woignier, T.; Phalippou, J.
CS   ICI Polyurethanes, B-3078, Belg.
SO   Journal of Non-Crystalline Solids (1998), 225, 64-68
CODEN: JNCSBJ; ISSN: 0022-3093
PB   Elsevier Science B.V.
DT   Journal
LA   English
AB   New org. gels were prepd. from chem. reactions conventionally used to make polyurethane foams. Reactions were carried out using CH_2Cl_2 as solvent. Solvent exchange occurs directly in the autoclave by flushing the gel with supercrit. CO_2. The subsequent org. aerogels were obtained by a classical CO_2 supercrit. drying process. They are nontransparent. The thermal evolution to a carbon aerogel was

investigated with a starting polymer aerogel having a bulk d. of 0.24 g/cm3 and a sp. surface area of 300 m2/g. As the temp. increases the sp. surface area and the bulk d. increase for temps. higher than 400°C. The pore morphol. strongly depends on the temp. as evidenced by SEM expts. The pyrolyzed aerogel has the texture of an ultrafine celled foam. Thermogravimetric anal. was related to dilatometric measurements and the aerogel d. vs. temp. was estd. Carbon aerogels were obtained at temps. of 600-800°C.

CC 57-8 (Ceramics)
Section cross-reference(s): 37

ST supercrit drying polyurethane aerogel pyrolysis transformation; polyurethane aerogel pyrolysis transformation carbon aerogel

IT Drying
(supercrit., carbon dioxide; polyurethane-based org. aerogels and transformation into carbon aerogels)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 5 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN 115:160929 HCA Full-text
OREF 115:27551a,27554a
TI Low-density carbonized composite foams
IN Kong, Fung Ming
PA United States Dept. of Energy, USA
SO U.S., 9 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4992254	A	19910212	US 1989-447478 <--	19891207
	US 5047225	A	19910910	US 1990-493534 <--	19900314
	US 5232772	A	19930803	US 1991-746528 <--	19910819

PRAI US 1989-447478 A3 19891207 <--

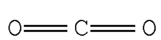
US 1990-493534 A3 19900314 <--

AB The title composite foam, useful as laser targets in controlled fusion reactions in chromatog. columns, high-temp. catalytic supports, and structural supports, are prepd. by (a) prepg. an inverse emulsion of styrene/divinylbenzene in water; (b) polymg. the mixt. to give a foam; (c) filling with aq. resorcinol-formaldehyde soln. inside cells of the foam; (d) curing the resorcinol-formaldehyde soln. to a gel; (e) heating the resorcinol-formaldehyde gel filled polystyrene foams to a temp. sufficient to carbonize the foam. Step (c) may use a phenol-aldehyde prepolymer for the filling of the foam. Thus, the emulsion is formed from an oil phase (styrene 1.38, divinylbenzene 1.38, and sorbitan monooleate 1.49 g) and an aq. phase (water 20.54 and sodium persulfate 0.205 g), which are mixed, heated for polymn. and crosslinking to give a foam, the pores filled consecutively with water/iso-PrOH, N2, and iso-PrOH, and then the pores filled with 2% resorcinol-formaldehyde soln. contg. Na2CO3 catalyst and water. Filling is done in vacuo, and then the foam is submerged in a resorcinol-formaldehyde soln. in a sealed bottle at 90°. Drying and pyrolysis at 1050° for 12 h in Ar, and cooling 24 h gave carbonized foam with d. 46 mg/cm3 and cell diam. <1 μm.

IT 124-38-9, Carbon dioxide, reactions
(liq., in decontamination of low-d. carbonized composite foams, for use in nuclear fusion)

RN 124-38-9 HCA

CN Carbon dioxide (CA INDEX NAME)



IC ICM C01B031-02

INCL 423449000

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 49, 71, 80

ST carbonized crosslinked polystyrene foam; nuclear fusion target carbonized foam; building support carbonized foam; resorcinol formaldehyde phenolic resin carbonization

IT Phenolic resins, uses and miscellaneous
(crosslinked polystyrene foams contg., carbonized, for targets in nuclear fusion)

IT Carbonization and Coking
(of resorcinol-formaldehyde polymer-filled divinylbenzene-styrene copolymer foam, for target in nuclear fusion)

IT Polymerization catalysts
(sodium carbonate, for resorcinol and formaldehyde in pores of crosslinked polystyrene foam)

IT   Building materials
        (support for, low d. carbonized composite foams as,
        prepn. of)
IT   Nuclear fusion
        (targets for, low d. carbonized composite foams as,
        prepn. of)
IT   Drying
        (supercrit., in prepn. of low-d. carbonized composite
        foams, as targets in nuclear fusion)
IT   497-19-8, Sodium carbonate, uses and miscellaneous
        (catalyst, for polymn. of resorcinol and formaldehyde in pores of
        crosslinked polystyrene foam)
IT   25014-41-9, Polyacrylonitrile   25212-86-6
        (crosslinked polystyrene foams filled by, carbonized,
        for targets in nuclear fusion)
IT   24969-11-7P, Resorcinol-formaldehyde resin
        (formation of, in crosslinked polystyrene foam pores,
        for carbonized low d. composite films in nuclear fusion)
IT   10028-17-8, Tritium, properties
        (liq., filling of low d. carbonized composite foams
        with deuterium and, in nuclear fusion)
IT   124-38-9, Carbon dioxide, reactions
        (liq., in decontamination of low-d. carbonized composite
        foams, for use in nuclear fusion)

L58 ANSWER 6 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN   115:94043 HCA Full-text
OREF 115:16189a,16192a
TI   Low-density resorcinol-formaldehyde resin aerogels and their
     manufacture
IN   Pekala, Richard W.
PA   United States Dept. of Energy, USA
SO   U.S., 8 pp. Cont.-in-part of U.S. 4,873,218.
     CODEN: USXXAM
DT   Patent
LA   English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4997804	A	19910305	US 1989-406009 <--	19890912
	US 406009	A0	19911115		
	US 199404	A0	19890901	US 1988-199404	198805

<--

US 4873218 A 19891010

PRAI US 1988-199404 A2 19880526 <--

AB The title materials obtained by polymn. of resorcinol with HCHO under alkali conditions give surface-functional polymer clusters which are crosslinked to give gels, which, under supercrit. conditions, form low-d. aerogels consisting of interconnected colloidal particles of diam. 100 Å. The aerogels can be carbonized to give low-d. foams with cell size 0.1 µm. Addn. of a metal salt promotes the formation of a C/metal composite with catalytic properties. Thus, polymn. of resorcinol with HCHO in presence of Na2CO3 and CF3CO2H and drying in liq. CO2 for 4 h gave aerogels. Addn. of chloroplatinic acid or PdCl2 in DMF to the aerogels prior to solvent exchange gave compns., which were supercrit. dried to give foams with Pt or Pd distributed throughout and then pyrolyzed at 500-1200° to give foams with high catalytic function.

IC B01V020-02; C08V009-28

INCL 502418000

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37, 67

ST phenolic resin manuf aerogel; resorcinol resin manuf aerogel; supercrit drying aerogel phenolic; carbonization phenolic resin aerogel; org foam phenolic resin aerogel; palladium contg aerogel catalyst; platinum contg aerogel catalyst

IT Carbonization and Coking
(of phenolic aerogels, to low-d. carbon foams
)

L58 ANSWER 7 OF 14 HCA COPYRIGHT 2008 ACS on STN

AN 98:144276 HCA Full-text

OREF 98:21997a,22000a

TI Study of the thermal behavior of foam polyurethanes by pyrolysis mass spectrometry

AU Khmel'nitskii, R. A.; Lukashenko, I. M.; Morozova, T. P.; Sharafanov, V. T.; Khlebnikova, M. V.

CS Mosk. S-kh. Akad., Moscow, USSR

SO Izvestiya Timiryazevskoi Sel'skokhozyaistvennoi Akademii (1983), (1), 186-91
CODEN: ITSAA7; ISSN: 0021-342X

DT Journal

LA Russian

AB Pyrolysis mass-spectrometric study of cellular polyurethane compns. revealed that their degrdn. at .ltorsim. 800° proceeds with and without formation of monomers for compns. PPU-3F and PPU-KF, resp., but in both cases with intense liberation of CO2 gas, indicating the random character of the process. PPU-3F was prepd. from diisocyanate

DUDEG-2 (diethylene glycol-tolylene diisocyanate copolymer) [83513-02-4] and polyester P-3 (adipic acid-glycerol-sebacic acid copolymer) [29087-60-3], and modified with red P (3.2%) and Cl (0.6%). PPU-KF was made by reaction of polyisocyanate with Lapramol 292 and Phosdiol [85243-25-0] (hydroxyethylated diethylene glycol diphosphonate).

CC 37-5 (Plastics Manufacture and Processing)

ST thermal degrdn cellular polyurethane; pyrolysis mass spectrometry polyurethane

IT Urethane polymers, reactions
(cellular, thermal degrdn. of, pyrolysis mass-spectrometric study of)

IT Polymer degradation
(thermal, of polyurethanes, cellular, pyrolysis mass-spectrometer study of)

IT 9073-12-5D, reaction products with P-3, chlorine- and phosphorus-contg. 85243-25-0D, reaction products with polyisocyanate and Lapramol 292 85256-22-0D, reaction products with polyisocyanate and Phosdiol
(cellular, thermal degrdn. of)

L58 ANSWER 8 OF 14 HCA COPYRIGHT 2008 ACS on STN

AN 91:6169 HCA Full-text

OREF 91:1129a,1132a

TI Combustion of cellular urethane

AU Bard, S.; Clow, K. H.; Pagni, P. J.

CS Mech. Eng. Dep., Univ. California, Berkeley, CA, 94720, USA

SO Combustion Science and Technology (1979), 19(3-4), 141-50
CODEN: CBSTB9; ISSN: 0010-2202

DT Journal

LA English

AB The properties of flames supported by pyrolysis of a com. available urethane mattress foam are described. The flame shape, flame growth, species concn., solid and gas phase temps., and mass loss were measured during a 6 min period after ignition. Functional descriptions of these empirical histories of the flame radius and height, flame spread, and mass loss rates are presented. Using a simple cone-cylinder model for the flame shape, measured temps., soot vol. fractions and H_2O and CO_2 concns., flame emissivities (εfl) in the homogeneous nongray approxn. were calcd. Flame soot contributes up to 95% of εfl throughout the fire history. The fraction of the total combustion energy release rate emitted as radiation avs. approx. 0.18. Approx. 1/3 of this flame radiation strikes the urethane through the lower flame cylinder; the remaining 2/3 is emitted through the upper flame cone to the surroundings. Surface emission plays a significant role in detg. the net radiative flux to the pyrolysis of urethane throughout the fire history. Predictions of the urethane pyrolysis rates, based on the model for radiant heat

transfer to the mattress, are in very good agreement with the exptl. mass loss rates. From comparison between predicted and exptl. mass pyrolysis rates, convective heating of the mattress is quite negligible.

CC 38-7 (Elastomers, Including Natural Rubber)

ST urethane foam mattress pyrolysis;
combustion parameter urethane foam; flame
urethane foam pyrolysis

IT Rubber, urethane, reactions
(combustion parameters of cellular, detn. of)

IT Carbon black, preparation
(formation of, in combustion of urethane foam
mattress)

IT Flame
(shape and growth, in combustion of urethane
foam mattress)

IT Combustion gases
(water and carbon dioxide, from urethane
foam mattress)

L58 ANSWER 9 OF 14 HCA COPYRIGHT 2008 ACS on STN

AN 77:1488 HCA Full-text

OREF 77:299a,302a

TI Toxic products from the combustion and pyrolysis of
polyurethane foams

AU Napier, D. H.; Wong, T. W.

CS Dep. Chem. Eng. Chem. Technol., Imp. Coll. Sci. Technol., London, UK

SO British Polymer Journal (1972), 4(1), 45-52
CODEN: BPOJAB; ISSN: 0007-1641

DT Journal

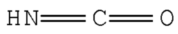
LA English

AB The thermal decompn. products of 4 polyurethane foams heated to 220-240.deg. in atms. of N2, 6% O2 in N2, and air were subjected to ir spectroscopy and chem. anal. for some of the anticipated toxic materials. When trichloroethyl phosphate [115-96-8] or O,O-diethyl N,N-bis(2-hydroxyethyl)aminomethylphosphon ate [2781-11-5][HOCH2CH2NHCH2P(o)(OEt)2] was added to or chem. incorporated into the foams, phosphorus [7723-14-0]-contg. compds. were evolved under most of the exptl. conditions. Hydrogen cyanide [74-90-8], isocyanate, urea [57-13-6], carbon dioxide [124-38-9], halogenated compds., and alkenes were also detected. The estd. concn. of degradation products used in these tests was .sim.0.5 ppm.

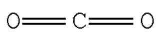
IT 75-13-8 124-38-9, uses and miscellaneous
(combustion gas, from polyurethane foams)

RN 75-13-8 HCA

CN Isocyanic acid (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 124-38-9 HCA
CN Carbon dioxide (CA INDEX NAME)



CC 4-3 (Toxicology)
ST phosphorus flame retardant toxicity; polyurethane foam
thermal decompn; toxicity polyurethane foam
IT Alkenes, uses and miscellaneous
Halogen compounds
(combustion gas, from polyurethane foams)
IT Combustion gases
(from polyurethane foams, toxicity of)
IT 57-13-6, uses and miscellaneous 74-90-8 75-13-8
124-38-9, uses and miscellaneous
(combustion gas, from polyurethane foams)
IT 26680-22-8
(foams, combustion gases of, toxicity of)

L58 ANSWER 10 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN 75:51076 HCA Full-text
OREF 75:8075a,8078a
TI Effect of smoke on the production and stability of high-expansion
foam
AU Alvares, N. J.; Lipska, A. E.
CS Stanford Res. Inst., Menlo Park, CA, USA
SO West. States Sect., Combust. Inst. [Pap.] (1971), No.
71-1, 31 pp.
CODEN: WSCPAH
DT Report
LA English
AB High-expansion fire-fighting foams are produced from solns. with low surface tension and high surface viscosity. Foam formation can be inhibited by products of both combustion and pyrolysis. Foam-breaking constituents are identified from a broad class of fuels-wood, paper, JP-5, Av-gas, and NFSO. An aq. soln. of foam conc. was sprayed onto a net and exposed to a large vol. of air flows. This produced a continuous foam mass, highly expanded and long lived. Combustion and pyrolysis products and their chem. constituents were introduced into

the air flow system, flow rates and foam degradation being controlled and measured. Pyrolysis products from all fuels tested destroy foam more effectively than combustion products, even though the latter are produced much faster. The pyrolysis products from wood are the most effective foam destroyers of all fuels tested. They are rich in chem. fractions, i.e. aldehydes, whereas combustion gives mostly CO_2 and H_2O. The concn. of the more effective foam breakers need be only ≤20 ppm. The fuel designations are not explained further.

CC 50 (Propellants and Explosives)
ST fire fighting foam smoke effect
IT Fires
 (extinguishing of, smoke effects on foams for)
IT Foam
 (fire-extinguishing, smoke effects on)
IT Smoke
 (foam stability in relation to, fire-extinguishing)
IT Gasoline, compounds
 (pyrolysis products of aviation, stability of fire-extinguishhing foam in relation to)
IT Fuels, jet
 Paper
 Wood
 (pyrolysis products of, stability of fire-extinguishing foam in relation to)

L58 ANSWER 11 OF 14 HCA COPYRIGHT 2008 ACS on STN
AN 72:56132 HCA Full-text
OREF 72:10301a,10304a
TI Rigid foam: manufacture and properties
AU Buist, J. M.; Hurd, R.; Stafford, R. L.
SO Advan. Polyurethane Technol. (1968), 187-250. Editor(s): Buist, J. M. Publisher: John Wiley and Sons Inc., New York, N. Y. CODEN: 17FIAH
DT Conference; General Review
LA English
AB A review, with 23 refs., includes the history of rigid-foam production, evaluation of resin and isocyanate starting materials, and adjunct materials, i.e. blowing agents, surfactants, catalysts, crosslinking agents, and flame-retardant additives, as well as preblending compounding problems. Flow, pressure development, and jig dwell time processing factors, and phys. properties of rigid polyurethane foams: internal pressure, thermal cond., dimensional stability, mech. properties, coeff. of expansion, esp. in building panels, ignition, burning, pyrolysis, and product fire resistance are discussed. Tests for closed-cell content, liq. H_2O content, H_2O-vapor transmission, d., tensile strength and modulus, and shear

properties are described, and a list of rigid foam machinery manufacturers is given.

CC 36 (Plastics Manufacture and Processing)

ST foam rigid review; review rigid foam; blowing agent foam; surfactant rigid foam; catalyst rigid foam; crosslinking agent foam; flame retardant foam; polyurethane foam rigid; thermal cond polyurethane foam; mech property polyurethane foam; fire resistance polyurethane foam; ignition polyurethane foam; water vapor transmission foam

IT Urethane polymers, preparation
(cellular, manuf. of rigid)

L58 ANSWER 12 OF 14 HCA

AN 72:3988 HCA Full-text

OREF 72:751a,754a

TI Evolution of toxic gases from heated plastics

AU Bott, Barry; Firth, Jack G.; Jones, Thomas Alwyn

CS Safety Mines Res. Estab., Min. Power, Sheffield, UK

SO British Polymer Journal (1969), 1(5), 203-4
CODEN: BPOJAB; ISSN: 0007-1641

DT Journal

LA English

AB The amt. and compn. of the gases evolved during the thermal decompn. of polyurethane (I), urea-HCHO resin foam (II), nylon, and polyacrylonitrile (III) in air and in N was studied. Product gases were analyzed qual. by ir and mass spectral methods, and quant. by colorimetry. The main products were HCN, NH_3, CO, N oxides, CO_2, and H_2O. The emission rate of each gas initially increased slowly with temp., but at a crit. temp. began to increase rapidly. The threshold temps. for the evaluation of each gas from each polymer were given. The wt. fraction of the polymers evolved as HCN at 500° and the activation energies for HCN and CO evolution were detd. (polymer, wt. % H CN in air, wt. % HCN in N, kJ/mole activation energy for CO in air, kJ/mole activation energy for HCN in air, kJ/mole activation energy for CO in N, and kJ/mole activation energy for HCN in N given): I, 0.57, 0.2, 67, 75, 64, 73; I, 1.35 1.4, 76, 95, 74, 73; II, 1.4, 0.2, 40, 34, 71, 42; nylon, 0.04, 0.03, 75, 56, 40, 38; III, 0.5, 0.4, 19, 42, 67, 44. All polymers evolved both HCN and NH_3, indicating that C-N bonds underwent > 1 reaction in pyrolysis. The similarity of the activation energies for HCN evolution in air and N suggested that the gas evolution mechanism was not affected by oxidn. reactions. The activation energies for CO evolution in air and N were similar when the polymer mols. contained large amts. of bound O.

CC 36 (Plastics Manufacture and Processing)

IT   Activation energy
        (of gas formation in pyrolysis of polymers)
IT   Nylon, reactions
     Urethane polymers, reactions
        (pyrolysis of, toxic gas formation in)
IT   Urea condensation products, reactions
        (pyrolysis of, toxic gas formation in)
IT   74-90-8P   630-08-0P, preparation
        (formation of, in pyrolysis of polymers)
IT   25014-41-9, reactions
        (pyrolysis of, toxic gas formation in)

AN   70:20597 HCA Full-text
OREF 70:3859a,3862a
TI   Bromine, chlorine, and phosphorus compounds as flame retardants in rigid polyurethane foam
AU   Burgess, Paul E., Jr.; Hilado, Carlos J.; Proops, William R.
CS   Res. and Develop. Dep., Union Carbide Corp., South Charleston, WV, USA
SO   Space Mil. Appl. Cell. Plast. Syst., Annu. Conf., Cell. Plast. Div., Soc. Plast. Ind., 12th (1967), 3-C-1-3-C-16 Publisher: Soc. of the Plast. Ind., Inc., New York, N. Y.
     CODEN: 20KNAL
DT   Conference
LA   English
AB   The ease of ignition, flame spread, fire endurance, fuel contribution, and smoke of 70 polyether polyurethane rigid foam contg. tetrabromoethane, (ClCH2CH2O)3PO, hexachlorobutadiene, or Arochlor 1254 flame retardants were used to evaluate the effect of the retardance and the usefulness of the various tests. The effect of the flame retardants on flammability performance varied with the polymer structure, flame retardant, and the flammability test used. Sucrose-based foam gave the best performance under conditions permitting pyrolysis of the carbohydrate structure to yield a carbonaceous char and water vapor to aid in flame extinguishment. Aromatic-based foam performed best when they melted prior to pyrolysis. Br-contg. retardants had excellent flame retardant properties due to the lower dissocn. energy of the C-Br bond and the high d. of the Br compds. in the volatiles evolved, but Br concns. >44.5% resulted in loss of mech. strength. Increases in the flame retardant which produced no significant effect in some flammability tests produced improvements in other tests due to the difference in the relative ability of the test to det. fire resistance under different exposure conditions.
CC   36 (Plastics Manufacture and Processing)
ST   bromine contg flame retardants; polyurethane foam

; foam polyurethane; flame retardant
foam; chlorine contg flame retardants; phosphorus contg
flame retardants; sucrose based foam

IT Fireproofing
(agents for, for urethane polymer foam)

IT Urethane polymers, properties
(cellular, fireproofing agents for)

IT Ethers
(poly-, fire-resistant urethane polymer foam
contg.)

IT Fire-resistant materials
(urethane polymer foam as, fireproofing
agents for)

IT 87-68-3 115-96-8 11097-69-1, Aroclor 1254 25167-20-8
(fire-resistant urethane polymer foam contg.)

IT 57-50-1, Sucrose
(reaction products with propylene oxide, fire-resistant
urethane polymer foam contg.)

IT 75-56-9, Propylene oxide
(reaction products with sucrose, fire-resistant urethane
polymer foam contg.)

L58 ANSWER 14 OF 14 HCA

AN 66:85696 HCA Full-text

OREF 66:16039a,16042a

TI Porous silver catalysts

PA Erdoelchemie G.m.b.H.

SO Neth. Appl., 8 pp.
CODEN: NAXXAN

DT Patent

LA Dutch

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	NL 6605594		19661031	NL 1966-5594 <--	19660426
	DE 1284627			DE	
	FR 1489078			FR	
	GB 1157922			GB	
	GB 1157923			GB	
	GB 1157924			GB	
PRAI	DE		19650429 <--		

AB Ag lactate (I) or I mixed with other metal lactates, such as Au, Pt,
Ba, Ca, and Ce, is decompd. by a heat treatment to give the title

catalyst (II) useful for oxidn. of olefins, such as ethylene (III) and propylene, to epoxyalkanes, or dehydrogenation of alcs. to aldehydes. Optionally, the porosity of II may be increased by addn. of a blowing agent, such as lactic acid hydrazide (IV), to I. II can activate the reactions at temp. nearly 100° lower, as compared with conventional catalysts. For example, 500 g. H2O-contg. cryst. I was heated slowly and uniformly on a dry plate. When H2O begun to evolve from the melt I, the temp. was increased at a rate of 3°/min. to 180°, while the melt I was decompd. under gas evolution and converted to foamlike dark colored masses. The surface of the obtained masses was heated by an open flame to 230° to initiate the afterdecompn. exothermically. After cooling, the masses were crushed to give 250 g. II (sp. gr. 4). II was charged into a diphyl-heated reaction tube (1 m. length, 21 mm. inner diam.). A mixt. of 5.0 vol. % III, 6.72 vol. % CO2, and 88.28% O-N mixt. was fed (200 l./hr.) into the tube at 160° to give a gas mixt. of III 3.64, CO2 7.60, ethylene oxide (V) 0.96 vol. %, and 87.80% O-N mixt. The yield of V was 70.5%. Moreover, addn. of 50 g. IV to 500 g. I gave II (sp. gr. 1.5-2.5) which improved the yield of V to 73% in the same reaction conditions.

IC B01J

CC 27 (Heterocyclic Compounds (One Hetero Atom))

IT 15768-18-0

(pyrolysis of, porous silver catalysts by)